

*Your
New Home*

**DESERVES THE
FINEST PLUMBING SYSTEM
AVAILABLE**

... and that means

STREAMLINE

TRADE MARK

REG. U. S. PAT. OFFICE

Copper

**PIPE AND
FITTINGS**



STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

COPPER

Everlasting Metal of the Ages

Copper is one of the oldest metals known to man. Throughout history it has been employed in innumerable ways to serve his purposes not only as weapons, ornaments and household utensils, but also as a building material.

Wherever we find authentic records of early civilization, we find that copper has always been preferred where metal of an enduring quality was necessary. There is still in existence copper that was used in ancient Egypt for conveying water 5400 years ago. In spite of the passing of nearly 60 centuries, this pipe remains in good condition and could still be used for the purpose it was originally intended to serve.

Copper arrow heads are dug from the earth, in a good state of preservation after centuries have rolled by.

Copper keels and bolts from stranded ships, subjected to the action of briny sea water for years, are salvaged in a perfect state of preservation.

During recent excavations in Pompeii which was covered with lava and ashes in the year 70 A. D. by an eruption of Vesuvius, copper pipe was unearthed, which was in such good condition that it could still be used today, after eighteen centuries have passed.

Until a few years ago copper pipe for plumbing purposes was comparatively rare in America, but thick walled copper pipe had been in use in the British Isles and Europe for about a hundred years.

Until a few years ago the method of joining lengths of this thick wall copper pipe was by threading them so that they could be screwed into the connecting fitting. Threading pipe reduces its thickness at the point where the connection is to be made. Consequently, the pipe has to be thicker than required in actual service so that it can be threaded and still leave enough wall thickness for conducting purposes. A foot of thick wall copper pipe weighs more than a foot of light wall pipe; consequently, its cost is greater per foot in proportion. This, of course, made the copper pipe so expensive that it was out of reach of the home builder of ordinary means.

The problem to solve was to develop a different method of joining the pipe so that its excess thickness could be eliminated.

With these facts in mind and after several years of experimentation, our engineers invented what is now internationally known as the STREAMLINE Solder Fitting. This fitting successfully solved the problem because it permits the use of thinner walled copper pipe. This pipe, although having a thinner wall, is more than thick enough to withstand anything that might be encountered under service conditions. This fitting is connected to the pipe by soldering by an ingenious and revolutionary method which produces a joint of extraordinary strength and leak-proof qualities.

STREAMLINE COPPER PIPE

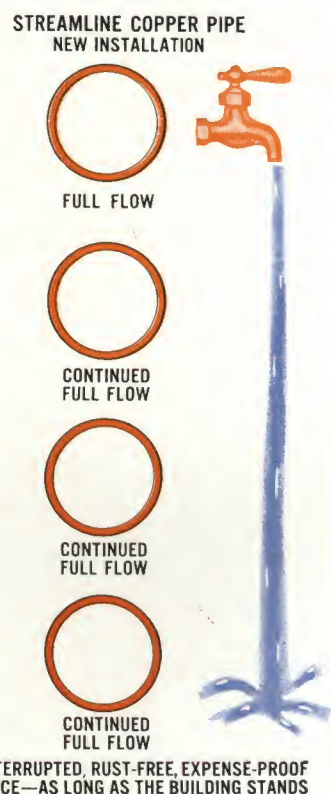
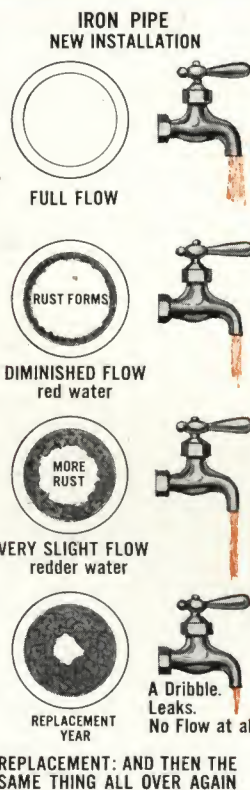
STREAMLINE Copper Pipe does not rust. On the contrary iron or steel pipe does rust and the rust while corroding the pipe also builds up an accumulation on the inside. As a matter of fact, iron rust occupies about ten times as much space as metallic iron. The iron rust gradually clogs the pipe until its waterway is almost, or even completely, eliminated. The result is a gradual diminishing of the water supply, and this supply contains impurities which are carried through the faucet by the flow of the water.

When rust once starts to accumulate in the interior of iron or steel pipe, it acts as an anchorage for other foreign matter which is present in practically all waters. Consequently, the interior becomes filled with a jelly-like mass of foreign particles combined with rust.

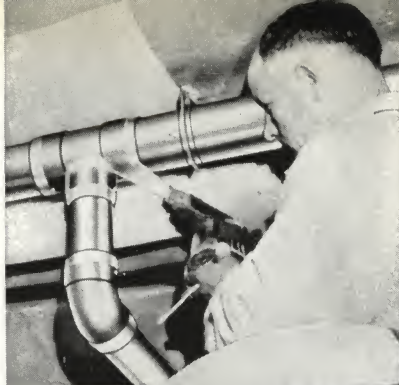
You've seen bathtubs that took an hour to fill, rust-stained water that colored the laundry—and heating systems that, no matter how much fuel was burned, failed to deliver a comfortable room temperature. In a great majority of cases this is due to rusted, clogged pipes.

THE FLOW CAPACITY OF AN INSTALLATION OF STREAMLINE COPPER PIPE AND FITTINGS CONTINUES TO BE UNIFORM AND FREE, DELIVERING A MAXIMUM FLOW YEAR AFTER YEAR. HEATING SYSTEMS ARE MAINTAINED AT THEIR MAXIMUM EFFICIENCY.

The illustration to the right gives a clear idea of what actually happens in rustable pipe as compared with a STREAMLINE Copper installation.



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HOW A JOINT IS MADE WITH COPPER PIPE AND STREAMLINE FITTINGS..

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A STREAMLINE Solder Fitting, as the name implies, is connected to copper pipe by soldering and with the aid of one of nature's laws which we call capillary attraction. Capillary attraction is a property liquids possess of rising or being drawn up between clean, close fitting surfaces.

Here the plumber has assembled some copper pipe and STREAMLINE Solder Fittings, and in the first illustration is heating the joint with a blow torch until it becomes hot enough to feed in the solder.

He then removes the torch and inserts wire or stick solder through a feed hole in the fitting. The solder coming in contact with the heated fitting becomes liquefied and is drawn in by capillary attraction and thoroughly bonds the pipe to the fitting. Owing to the never-failing law of capillary attraction, the solder is drawn in, down or up regardless of where the feed hole is located, always provided that proper conditions of tolerance and cleanliness are present. While the pipe and fitting shown in these illustrations is larger than that used in an ordinary residential installation, it serves to show more clearly how the joint is made.

When the work is properly done by plumber or steam-fitter, connections are made that are enormously strong and permanently leak-proof.

The OLD Method

Before the invention of the STREAMLINE Solder Fitting, practically all pipe, whether copper, brass, iron or steel, had to be threaded into the fitting to make a connection. Owing to the thick wall of copper and brass, it was very expensive, yet it had to be thick to cut a thread to connect it to the fitting, so that all the unthreaded portion was mostly expensive excess metal which rendered no service for its extra cost. Iron and steel pipes were subject to rust and leaky joints through corrosion and vibration. Their exposed threads inside the pipe often became anchorage points



Why it is expensive and inferior!



for the building up of rust and other accumulation in the water. Sooner or later it had to be replaced.

The STREAMLINE Method

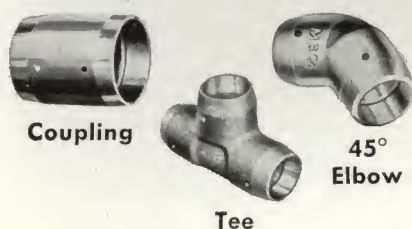
This illustration shows a piece of copper pipe connected with a STREAMLINE fitting. The pipe has been cut away so you can actually see the end of the pipe where it fits inside the fitting. Also, visible is the solder where it has filled the feed hole and where it has bonded the outer surface of the pipe to the inner wall of the fitting. Now as explained above, since this pipe is not threaded to connect and carries no extra wall thickness for that purpose, but is joined by this new unique method, only that wall thickness required in actual service is used and that is all that you pay for. Since the copper pipe won't rust, it doesn't need an extra heavy wall and it is made hard enough by working to withstand any abuse which might affect it in service.



Why it is superior and lasting!



With the old method of connecting, the joint was really the weakest point in the whole system, while with a STREAMLINE installation it is actually the strongest.



Illustrated here are three STREAMLINE fittings that are commonly used, the coupling, the 45° elbow and the tee. Although these are but three of the many thousands of fittings which comprise the complete line for all different piping purposes, they will give you a fairly good idea of just what a STREAMLINE fitting is and what it looks like. The small holes in the fittings are called solder feed holes, and as the name implies, are for feeding in the solder to bond them to the pipe.

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STREAMLINE PIPE AND FITTINGS GIVE YOU

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all these Advantages...

LEAK-PROOF—When an installation of STREAMLINE Copper Pipe and Fittings are installed by a capable plumber, you need have no cause to worry about leaks. Leaks between ceiling and floor or behind walls due to faulty workmanship may be a very serious and expensive matter. They may do many dollars

worth of damage, not only to the walls or ceilings, but to the furnishings of the house as well, to say nothing of the inconvenience and expense of repair. Owing to an exclusive feature of the STREAMLINE Solder Fitting, the plumber can visually tell when the joint is leak-proof even without testing it.

RUST-PROOF—An installation of STREAMLINE Copper Pipe and Fittings is rust-proof. There will

be no rust-stained laundry, bathtubs or lavatories.

FREE FLOW OF WATER

Since STREAMLINE Copper Pipe does not rust, and since it offers the greatest possible resistance to clogging, a full flow of water is permanently assured. Hot water

runs quicker and hotter. Radiators do an efficient heating job. A non-rusting heating system is your best insurance against excessive fuel bills.

INEXPENSIVE—STREAMLINE Copper Pipe and Fittings for your plumbing system cost very little, if any more than rustable materials; in fact, so little that it is hardly worth considering, because under normal water

conditions it will give you peak service for the life of the building. Considering that there will be no future repair bills, STREAMLINE actually costs less than rustable piping.

Consult your Architect or Contractor

Be sure that your architect draws up the specifications to include STREAMLINE Copper Pipe and Fittings. When your architect specifies STREAMLINE, make sure that your contractor actually installs it. Do not allow any substitute. Insist on genuine STREAM-

LINE. It is marked for your identification. Even though your present plans may call for "ordinary" pipe and fittings, you can change to STREAMLINE.

Consult your Plumbing Contractor

Your plumbing contractor is an experienced and capable mechanic. The great majority of plumbing contractors have already installed STREAMLINE in many buildings. They know how efficient a STREAMLINE system is. They also know that, once they have installed it, they will have no complaints from you.

Remember too, that no matter how modern and expensive your bathroom and kitchen fixtures may be, their effectiveness depends upon a permanently reliable piping system.

For Modernizing your Present Home

If your home at present is equipped with the rustable type of pipe and fittings, it is probably beginning to give you trouble. If not now, it is inevitable, that in a comparatively short time, it will. The pipe will clog, rust, leak and deliver impure and rust-stained water. Why not for safety's sake have the present worn-out system replaced now with STREAMLINE Fittings and Copper Pipe... have it done before the damage happens. Don't make the mistake of replacing the worn-out plumbing or heating system with another system of rustable pipe and fittings that will again in a few short years begin to give you trouble.

Answer to Modern Home Heating

NO MORE COLD FLOORS

A CONTINUOUS
FLOW OF RADIANT HEAT

THRUSH

FORCED CIRCULATING FLOW CONTROL SYSTEM
HOT WATER HEAT



PLAN FOR

REAL HEATING

COMFORT NOW!

You can enjoy **THE ADVANTAGES OF HOT WATER HEATING AT LOW COST**

MILD HEALTHFUL HEAT

In planning your new home, remember that heating controls your enjoyment of it many months of the year. Your health may depend upon heating—and it is an important factor of living cost in all the years to come. Choose *hot water heat* for its *mild, healthful quality*. Ask any homeowner who has Thrush Hot Water Heating!

EASILY CONTROLLED

Thrush Flow Control System for automatically fired hot water heating, with *forced circulation*, is as far ahead of the old-fashioned heating your father may have had as the streamlined trolley-bus of today is ahead of the horse-drawn street cars of a generation back. Development of the Thrush Water Circulator has made heating with water the finest and most accurately controlled home heating you can possibly imagine.

NO "ROASTING" OR "FREEZING"

No longer need you suffer the alternate "freezing" and "roasting," the ups and downs of other forms of heating. Now the mild, healthful *radiant heat* of hot water gives you uniform comfort throughout your home—and it is very economical to install and operate when Thrush Flow Control System is used.

NO MORE "SCORCHED" AIR

You do not breathe the "scorched" and vitiated air which is inevitable with hot air heating and you will not need expensive winter "air conditioning" because hot water heating does *not destroy the freshness of the air in the first place*.

AND IT'S "QUICK HEAT"

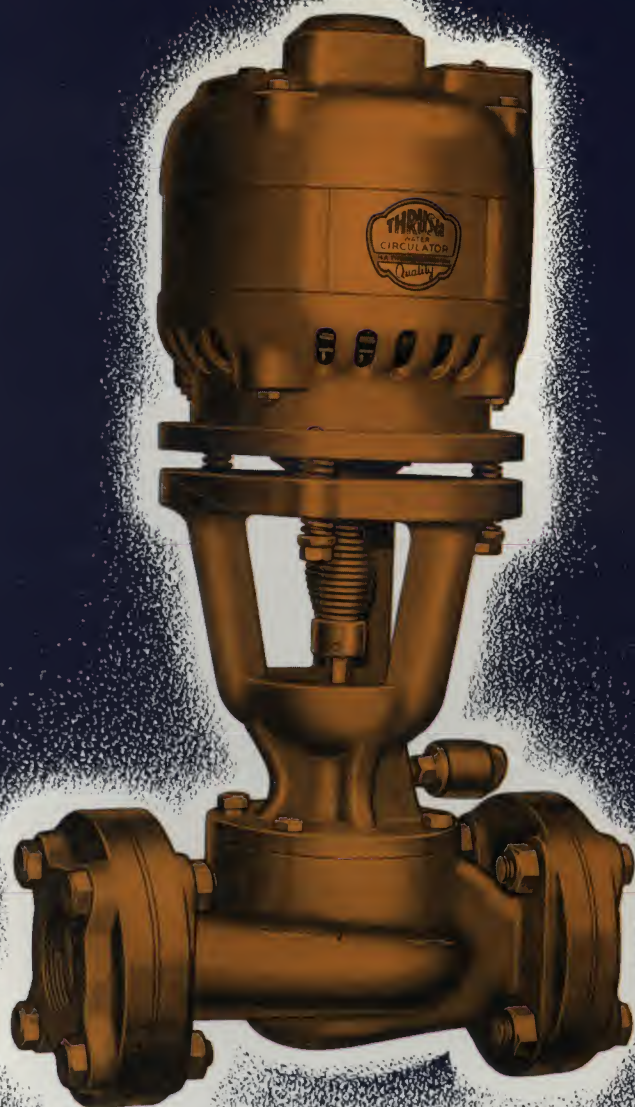
The Thrush devices provide a unique operation different from any other type of heating. No longer do you wait for the boiler (or furnace) "to heat up." Now a charge of heated water is *kept in the boiler at all times* so that it can be released to the radiators whenever heat is needed.

THRUSH HOT WATER HEATING IS AVAILABLE AT

THRUSH

**FORCED CIRCULATING FLOW CONTROL
FOR AUTOMATICALLY FIRED
HOT WATER HEATING SYSTEMS**

*The Finest System of Home Heating
Yet Devised!*

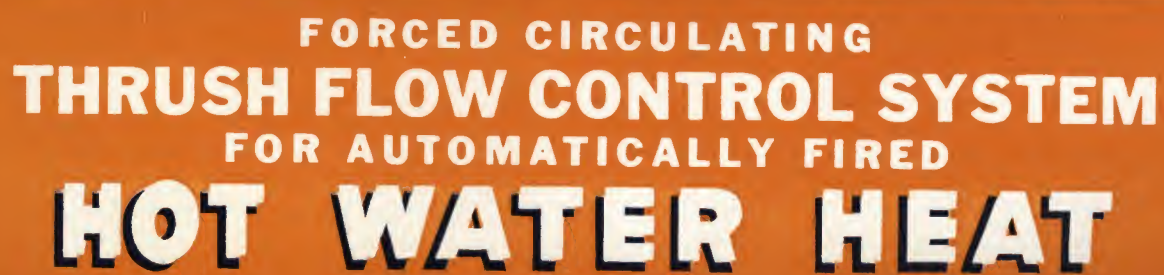


THRUSH CIRCULATOR HAS REVOLUTIONIZED HEATING

THIS is the heart of the modern automatic hot water heating plant, the key to the efficiency of Thrush Flow Control System—the motive power which provides forced circulation to every radiator, even if below the level of the boiler or in a separate building.

LOWER COST THAN EVER

- ★ **FORCED CIRCULATION**
makes possible lower installation costs using smaller pipe, valves and fittings.
- ★ **UNIFORM HEATING**
is assured in every room because every radiator, regardless of location, receives the same instantaneous heat delivery.
- ★ **STORED HEAT**
A charge of heated water is maintained in the boiler at all times so that it can be delivered to the radiators whenever the Thrush Radiant Heat Control calls for heat.
- ★ **NO BULKY PIPES**
Forced circulation makes possible the use of small copper pipe which takes up no usable space in your basement and is less expensive to install. There is plenty of space in your basement for a recreation room when you use Thrush hot water heating.
- ★ **LOWER INSTALLATION COST**
The reduction in material and labor costs through the use of Thrush System often completely offsets the cost of the Thrush devices.
- ★ **LOWER FUEL COST**
Records from coast-to-coast prove that a Thrush Flow Control Hot Water System can be operated more economically than any other type of heating plant in use today.
- ★ **NO OVERHEATING**
Its economy is due to accurate and complete control of heating medium and firing device. Wasteful and unhealthy overheating is completely eliminated.
- ★ **CONSTANT RADIANT HEAT**
You do not have that feeling of chilliness experienced with other forms of heating when the burner is "off" because radiators maintain body comfort through continuous radiant heat. No sudden drafts, no "layer cake" heating—the floors where the children play are warm.



FORCED CIRCULATING THRUSH FLOW CONTROL SYSTEM FOR AUTOMATICALLY FIRED HOT WATER HEAT

Here are the Controls

THAT MAKE THIS POSSIBLE!

IT IS IMPORTANT to recognize that Thrush does not make or sell boilers or radiators but your heating contractor will figure the job complete with Thrush Flow Control System (see illustration at left—Thrush devices are in white). Because of the greatly increased efficiency, due to the inclusion of Thrush Controls and especially to the forced circulation feature, the saving in labor and materials due to the use of smaller pipe, valves, fittings, etc., often completely offsets the cost of the Thrush equipment, so you can have the finest modern heating plant at a lower price than you would have to pay for the old-fashioned uncontrolled system.

1. THRUSH WATER CIRCULATOR

circulates water through every radiator quickly and positively when heat is required. There is no circulation from the boiler through the radiators when the Circulator is not running.

2. THRUSH FLOW CONTROL VALVE

opens automatically when the Thrush Circulator operates and closes automatically when it stops. This prevents overheating and waste of fuel. It allows hot water to circulate through the radiators only when heat is needed.

3. SAFE PRESSURE RELIEF—Because hot water expands when heated, a No. 4 Thrush Pressure Relief Valve is included with every Thrush Flow Control System. It will positively relieve excessive pressures and prevent damage from this source.

4. AUTOMATIC FILLING—Thrush Flow Control System is more completely automatic than any other hot water system ever was before. The No. 12 Thrush Pressure Reducing Valve keeps the system full of water—fills it automatically. When your heating plant is Thrush equipped you can forget about it—just enjoy it.

10. SPECIAL THRUSH GAUGE AND THERMOMETER

5. THRUSH PRESSURE TANK—When water in the heating system gets hot it expands. In Thrush System it is not wasted through the overflow but goes into this tank.

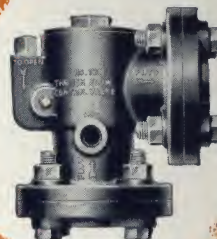
6. PLENTY OF HOT WATER—Thrush Water Heater, included as a part of the system, assures a plentiful supply of domestic hot water for kitchen, laundry and bath at trifling expense and eliminates the need for installing and operating a separate water heater.

7-8. CONSTANT RADIANT HEAT—No. 201 Thrush Radiant Heat Control included in Thrush Flow Control System maintains room temperatures at an even level and provides constant radiant heat (inset 7 is No. 198 Thrush Relay Transformer to provide low voltage for No. 201).

9. WATER TEMPERATURE CONTROL—No. 203 Thrush Modulating Water Temperature Control automatically raises or lowers boiler water temperature to meet the demands placed on the heating system by outdoor temperature fluctuations, saves fuel and relieves you of remembering another chore.



THRUSH WATER CIRCULATOR



THRUSH FLOW CONTROL VALVE



THRUSH PRESSURE RELIEF VALVE



THRUSH PRESSURE REDUCING VALVE



AIR-TIGHT THRUSH PRESSURE TANK

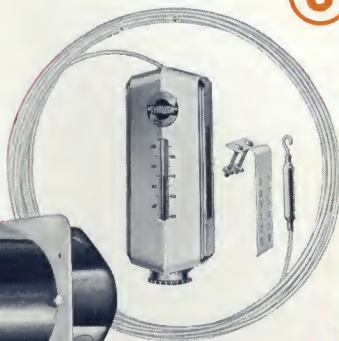


THRUSH WATER HEATER

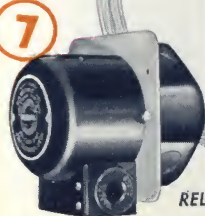


THRUSH MODULATING WATER TEMPERATURE CONTROL

THRUSH RADIANT HEAT CONTROL



RELAY TRANSFORMER



Just Ask Any Thrush Owner

Your friends who have homes heated with Thrush Flow Control Hot Water System will tell you it is the most delightful experience their new home has provided.

It is so completely automatic you can forget about it from one heating season to the next.

Your fuel bills will be amazingly low because Thrush equipment greatly increases the heating efficiency of the heating boiler you install and permits the automatic firing device to operate at its peak efficiency.

Constant radiant heat is a new and modern development—something you must experience to really appreciate. Thrush Controls are as sensitive to change as the human body itself.

They even anticipate the weather changes and provide added heat in the radiators when the temperature outdoors drops.

You don't wade in cold air while suffocating around your head and shoulders. Stratification of heat due to sudden starting and stopping of the source of heat is entirely eliminated by Thrush equipment.

And too, you have the luxury of plenty of low cost hot water all of the time for every household need.



MODERN *Zoned* HEATING

THRUSH forced circulation makes possible the use of hot water heating in homes without a basement and at the same time it makes it entirely feasible to heat separate buildings or apartments, with individual controls, from the same heating boiler. This greatly reduces installation and operating expense and is an ideal arrangement for large estates and groups of factory buildings, cantonments, etc. It also permits the modern convenience of two-zone heating in the ordinary residence—one degree of temperature uniformly maintained in the living rooms on the ground floor, while a different temperature is maintained in the sleeping rooms where many people object to too much heat. It is all accomplished automatically.



NO COLD "70"

How Thrush System

**OPERATES SO EFFICIENTLY —
COSTS SO LITTLE FOR FUEL!**

LET'S REVIEW the advantages of adding Thrush Flow Control System to your hot water heating plant. First, it gives you a new heating comfort through constant radiant heat which you have never before experienced. It makes your system so entirely automatic that you can forget all about heating. It is more uniform and healthful than other forms of heating, does not dry out the air and has no alternate periods of "freezing" and "roasting." It is so efficient because there is no dependence on gravity or thermal circulation

Circulation is forced. Such circulation can be completely controlled so there is no waste of heat through overheating and wide fluctuations of temperature in the building never occur. (It costs more to heat a building that has been allowed to cool off too far than it does to maintain it at a uniform temperature.) Because all of the heat is used efficiently and none of it is wasted, Thrush owners tell us that their fuel bills are amazingly low. Many of them write us that they could hardly believe their eyes when they saw the totals for the first year's operation. Prominent home builders throughout the country install Thrush System because they know it helps them sell the homes they build. Certainly you want this fine, modern, streamlined heating for your home.

Now here's the best and most exciting news of all. The finest copper pipe job with the heating boiler of your choice—plus all Thrush controls—can be placed in your home even on the most modest budget.

Costs Less to Install

THAN THE OLD-FASHIONED GRAVITY JOB

BECAUSE Thrush forced circulation makes possible the use of small pipe, valves and fittings (with less labor), you can now have hot water heat in your home at a cost that compares favorably with that of any other form of heating. Remember too—a hot water system is an investment that lasts a lifetime. Modern radiators are more efficient and styled to modern home design. Thrush controlled automatic Hot Water Heating will give your home greater resale value too—you should get your money back if you ever sell.



And Enjoy Plenty of Hot Water

ALL YEAR THRU - AT NO EXTRA COST

REALLY HOT
PLENTY OF IT
FOR EVERY NEED



No. 75 High Pressure Thrush Relief Valve protects domestic water system.

11

The THRUSH WATER HEATER

WHEN you have installed a Thrush Water Heater as a part of your Thrush Flow Control System you can enjoy the luxury of "soaking" in the shower or bath to your heart's content — knowing there'll be plenty of hot water for others and all the household needs besides. This is only one of so many outstanding advantages, we know you'll want to talk it over with your heating man. Be sure to tell him you want automatic hot water heat with Thrush Flow Control System installed with the hot water heating boiler you select. Added enjoyment of your home will repay you many times over.

TELL YOUR HEATING CONTRACTOR YOU WANT THRUSH HEAT!

H. A. THRUSH & COMPANY

PERU, INDIANA